

## Message Text

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TO USMISSION NATO

C O N F I D E N T I A L STATE 206061

E.O. 11652: GDS

TAGS: NATO, ETEL, MARR

SUBJECT: US RESERVATIONS ON ITALIAN PRESENTATION, "DIGI-  
TALIZATION IN THE NATO COMMUNICATIONS SYSTEMS", 16 JANUARY  
1975

REF: NJCEC DECISION SHEET, AC/270-DS/18, DATED 12 JUNE 75

1. REQUEST THAT YOU PROVIDE THE FOLLOWING INFORMATION TO  
THE CHARIMAN NJCEC IN RESPONSE TO ITEM XV OF AC/270-DS/18.

2. ITEM XV OF REFERENCE RECORDS THE NJCEC DECISIONS RE-  
GARDING THE ITALIAN PRESENTATION ON DIGITALIZATION WHICH  
INCLUDES THE NOTATION THAT US REPRESENTATIVES HAD SOME  
RESERVATIONS ON CERTAIN TECHNICAL POINTS AND THAT THESE  
WOULD BE COMMUNICATED TO THE ITALIAN AUTHORITIES AND TO  
NICSMA IN DUE COURSE. THIS PAPER EXPRESSES THE CURRENT US  
VIEWPOINT ON THE SUBJECT OF DIGITALIZATION IN NATO  
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COMMUNICATIONS SYSTEMS.

3. THE PRIMARY US RESERVATIONS FOCUS ON TWO POINTS,  
NAMELY:

- A. LIMITING THE CHOICE OF MODULATION TECHNIQUES AND
- B. DISREGARDING SYSTEMS USING BIT RATES LOWER THAN 32 KBPS.

BOTH OF THESE POINTS ARE MENTIONED IN PARAGRAPH 2, PART I, OF THE ITALIAN 16TH JANUARY 1975 MEMORANDUM.

4. LIMITING THE CHOICES TO PCM (PULSE-CODE MODULATION) AND DCDM (DIGITALLY CONTROLLED DELTA MODULATION) MAY BE UNNECESSARILY RESTRICTIVE AT THIS STAGE OF DEVELOPMENT. WHILE EMPHASIZING THESE TECHNIQUES IN THE EARLY DESIGN/IMPLEMENTATION STAGES OF THE NICS, TO OPTIMIZE TRANSMISSION MEDIA CAPABILITY AND TO ENHANCE OVERALL INTEROPERABILITY, OPTIONAL METHODS THAT BECOME AVAILABLE SHOULD BE EVALUATED FOR POTENTIAL INCREASES IN EFFICIENCY AND/OR PERFORMANCE. THE ADVANTAGES AND DISADVANTAGES OF OTHER DIGITAL MODULATION TECHNIQUES SHOULD BE GIVEN DUE CONSIDERATION AT MAJOR IMPLEMENTATION MILESTONES IN THE NICS CONVERSION PROCESS.

5. ALTHOUGH SYSTEMS USING BIT RATES LOWER THAN 32 KBPS MAY NOT OFFER ACCEPTABLE CHANNEL QUALITY AT PRESENT, A LONG-RANGE GOAL OF ATTAINING LOWER BIT RATES SHOULD BE ESTABLISHED. THE US IS WORKING TOWARD 16 KBPS NOW AND HAS SPECIFICALLY AGREED WITH THE EUROGROUP TO WORK TOWARD THAT RATE. THE POSSIBILITY OF EVENTUALLY REACHING 8 KBPS, OR LOWER, IS BEING EXPLORED WITH NEW MODULATION AND CONVERSION TECHNIQUES; THEREFORE, DISREGARDING OF SYSTEMS USING BIT RATES LOWER THAN 32 KBPS APPEARS UNDULY RESTRICTIVE.

6. THE RATIONALIZATION OF TELECOMMUNICATIONS IN NATO BY INTERCONNECTION, SHARING, INTEROPERATION, OR OTHER MEANS WILL BECOME MORE DIFFICULT, TECHNICALLY, IN DIRECT PROPORTION TO THE EXTENT THAT SPECIFIC SYSTEM CHARACTERISTICS OF THE NICS AND COLLOCATED SYSTEMS DIVERGE FROM EACH OTHER, E.G., ANALOG VERSUS DIGITAL. SPECIFICATIONS, WHERE  
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POSSIBLE, SHOULD BE AGREED TO ENHANCE INTEROPERABILITY AND PERMIT STANDARDIZATION. PRESENTLY, KEY NEAR TERM MILITARY TELECOMMUNICATIONS SYSTEMS PLANNED FOR EUROPE WILL BE DIGITAL BUT CURRENT PLANNING IS FOR NICS TO BE ANALOG. MODERN COMSEC OPERATIONS ARE BASED ON DIGITAL TECHNIQUES. THIS TREND TOWARD INCREASED APPLICATION OF DIGITAL TECHNOLOGY TO MILITARY TELECOMMUNICATION SYSTEMS IS EXPECTED TO CONTINUE AS EXISTING ANALOG SYSTEMS ARE BEING CONVERTED TO DIGITAL OPERATION.

7. DIGITAL SYSTEMS POSSESS INHERENT ADVANTAGES OF RELIABILITY, MAINTAINABILITY, AND PERFORMANCE QUALITY. HOWEVER, EXPLOITING THESE IN A SYSTEM REQUIRES PLANNING IN

ALL ASPECTS OF SYSTEM DESIGN.

8. CONVERSION OF EXISTING OR COMMITTED FREQUENCY DIVISION MULTIPLEX SYSTEMS TO DIGITAL OPERATION REDUCES THE NUMBER OF CHANNELS AVAILABLE IN GIVEN BANDWIDTH CONSIDERABLY. ASIDE FROM THE COSTS INVOLVED IN EXPANDING CAPACITY OR ADDING ROUTES TO COMPENSATE, FREQUENCY SPECTRUM AVAILABILITY IS A LIMITING FACTOR IN SOME AREAS.

9. ECONOMIC IMPLICATIONS VERSUS TECHNICAL ADVANTAGES FOR DIGITALIZATION INVOLVE BOTH SHORT AND LONG TERM ASPECTS. WHAT MAY BE DESIRABLE FOR A LONG-RANGE TECHNICAL GOAL MAY NOT BE ECONOMICALLY ACHIEVABLE IN THE SHORT TERM. IN ADDITION TO DIRECT COST COMPARISONS, SECONDARY EFFECTS INTRODUCE FACTORS SUCH AS SYSTEM MAINTENANCE, INTERFACE DEVICES, NETWORK RESTORAL AND EXTENSION, AND COMPATABILITY WITH PRESENT COMMITMENTS.

10. DURING THE TRANSITION PHASE, A MAJOR PROBLEM CONCERNS INTERFACES REQUIRED AMONG ANALOG AND DIGITAL EQUIPMENTS AND TRANSMISSION LINKS. A CONCEPT FOR DEALING WITH THIS PROBLEM, AND AN ASSESSMENT OF THE COST AND CAPABILITY IMPLICATIONS OF DOING SO, SHOULD BE MADE A MATTER OF PRIORITY EFFORT IN DEVELOPING PLANS FOR DIGITALIZATION.

11. EMERGING DIGITAL TECHNOLOGY OFFERS A WIDE VARIETY OF DIFFERENT DIGITAL PULSE MODULATION METHODS AND ANALOG-CONFIDENTIAL

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DIGITAL CONVERSION TECHNIQUES. VARIATIONS OF THESE METHODS AND TECHNIQUES PROPOSED OR PLANNED FOR USE BY OTHER SYSTEMS INFLUENCE SELECTION OF ULTIMATE TECHNIQUES.

12. MOST LARGE MILITARY TELECOMMUNICATION SYSTEMS RELY IN SUBSTANTIAL DEGREE UPON LEASED TRANSMISSION RESOURCES. THEREFORE, THE FUTURE AVAILABILITY, ARCHITECTURE, AND COST OF LEASED DIGITAL TRANSMISSION SERVICE CONTINUE TO BE OF INTEREST TO TELECOMMUNICATIONS PLANNERS AND ENGINEERS.

13. THE US AGREES THAT THE FUTURE NICS NODAL NETWORK SHOULD ULTIMATELY BE DIGITAL. MOREOVER, THE US SUPPORTS THE ITALIAN RECOMMENDATION ON THE NEED FOR EXTENSIVE STUDIES AND PLANNING EFFORTS BY THE NATO IN THE DEVELOPMENT OF DIGITALIZATION CONCEPTS AND IMPLEMENTATION PLANS FOR THE NICS, AND IS CONSIDERING THE DEVELOPMENT OF A US PROPOSAL FOR CONSIDERATION BY DIRECTOR GENERAL, NICSMA, THAT THE ACE HIGH REPLACEMENT/REFURBISHMENT PROGRAM ADDRESSED IN NICSMA/HB(75)4, 4 JUNE 1975, INCLUDE DIGITALIZATION OF APPROPRIATE PORTIONS. INGERSOLL

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